

Appl. No. 10/574,186
Amdt. dated Mar. 4, 2009
Reply to Office action dated Dec. 10, 2008

Amendments to the Drawings:

The attached sheets of drawings includes changes to Figs. 3-6, and 9. These sheets, which include Figs. 2-6 and 9, replace the original sheets including Figs. 2-6 and 9.

Attachment: Three (3) Replacement Sheets

REMARKS

This paper is filed in response to the Office action mailed on December 10, 2008. Claims 1-6 and 8-25 are presented herewith. In view of the foregoing amendments and following comments, Applicants respectfully request reconsideration and allowance of all pending claims.

The Office action asserts several objections to the drawings. First, the Office action submits that the drawings fail to comply with 37 CFR 1.84(p)(4) for using reference characters “95” and “9” to designate the pure metal portion of the substrate as shown in Fig. 9, step 201, and for using reference characters “9” and “5” to designate the metal portion of the substrate in Figs. 1-5. Replacement drawing sheets are submitted herewith to address these inconsistencies. In corrected Fig. 9, both instances of reference character “95” are removed and replaced with reference numeral “9” in step 201 and with reference numeral “5” in step 201. Additionally, each instance of reference numeral “5” appearing in Figs. 3-5 has been replaced with reference numeral “9” to be consistent with the foregoing change. Accordingly, the appropriate reference numerals are now used in the drawings to identify the substrate and aluminum layer, and therefore this objection should be withdrawn.

The drawings were also objected to under 37 CFR 1.84(p)(4) for using reference numeral “15”¹ to identify both carbon and carbon nanotubes. The specification has been amended so that reference numeral 15 consistently refers to carbon nanotubes, and therefore this objection should be withdrawn.

The drawings were further objected to under 37 CFR 1.84(p)(4) for using reference numeral “71” to designate both metal and a thin insulating layer. The specification has been amended so that reference numeral 71 consistently refers to the thin insulating layer, and therefore this objection should be withdrawn.

Still further, the drawings were objected to under 37 CFR 1.84(p)(4) for using reference numeral “5” to designate both a nanoporous membrane and a microporous membrane. The

¹ The Office action specifically identifies reference character “3”, but it appears that the Examiner intended to refer to reference character “15” as that reference character is present in the parts of the specification noted in the Office action.

specification has been amended so that reference numeral 5 consistently refers to a nanoporous membrane, and therefore this objection should be withdrawn.

Additionally, the drawings were objected to under 37 CFR 1.84(p)(5) for including reference character “95” which is not mentioned in the written description. A corrected Fig. 9 is submitted herewith in which reference character “95” has been removed, and therefore this objection should be withdrawn.

The specification was objected to for several informalities. First, the Office action observes that “aluminum 9” is labeled in step 100 of Fig. 1, but not described until step 200. The specification has been amended to include a description of “an aluminum layer 9” in the portion of the specification describing step 100, and therefore this objection should be withdrawn.

Next, the Office action observed that “island 65” is labeled in step 1065 of Fig. 6, but not described in the specification until step 1080. In response, Fig. 6 is amended to delete reference character “65” and to add reference characters “57” and “58” as introduced in previous steps. Accordingly, this objection should be withdrawn.

Additionally, the Office action asserted that the “gate” of the transistor is referred to as a “grid” of the transistor, and requests correction. Each instance of the word “grid” has been deleted and the word “gate” is substituted therefor. Accordingly, this objection should be withdrawn.

The Office action also asserted that a metal 77 is labeled in step 1062 of Fig. 8, but is not described until step 1122 in the specification. Page 14, line 12, of the specification as originally filed provides a description of step 1062 that includes a reference to “metal” but does not use a reference numeral. This paragraph of the specification is amended to include reference character “77,” and therefore this ground of rejection should be withdrawn.

Still further, the Office action objected to the specification at page 15, lines 29 to 32 for describing Fig. 10 as “containing only an optional step 201” but that additional steps 301a onward also appear in Fig. 10. The Examiner suggests correcting this by amending “page 9, lines 12-17.” This part of the specification, however, is not relevant to the description of Fig. 10 and therefore the Examiner’s suggestion appears to be in error. Furthermore, page 15, lines 29-

32 do not state that “only” optional step 201’ appears in Fig. 10, as argued by the Examiner. To clarify this matter, however, Applicants have amended the paragraph beginning on page 15, line 33, to explicitly indicate that Fig. 10 also illustrates an exemplary embodiment of step 301.

The specification was further objected to for allegedly asserting at page 15, line 35 that the sequences 301a through 301b are part of Fig. 9. The excerpt identified by the Examiner includes no such statement. Furthermore, the amendment to the specification noted immediately above clarifies that the sequences are illustrated in Fig. 10. Accordingly, this ground of objection should be withdrawn.

Still further, the specification was objected to for stating “consists in a succession” instead of “consists of a succession” at page 15, line 34. Applicants have amended this portion of the specification as suggested by the Examiner, and therefore this objection should be withdrawn.

Finally, the specification is objected to for including an embedded hyperlink at page 1, lines 11-12. The specification is amended to remove this element.

Turning to the claims, claim 23 is objected to for using the pronoun “itself.” Claim 23 is amended to remove this word, and therefore this ground of claim objection should be withdrawn.

Claims 1-25 stand rejected under 35 USC § 112, second paragraph, on several grounds. First, claim 1 was rejected for including the words “comprising” and “consisting.” Claim 1 is amended herein to remove the word “consisting.” Next, the Examiner asserts that the term “calibrated pores” appearing in claim 2 does not have a well-defined meaning in the art and is therefore indefinite. In response, claim 2 is amended to specify that the pores of the nanoporous membrane have a calibrated size. The paragraph beginning at page 11, line 16, of the original specification provides support for this claim language. Finally, claim 22 is rejected for lacking antecedent basis for the phrase “the plane of the substrate.” Claim 22 is amended to address this deficiency.

Turning to the rejections based on the prior art, claims 1-5, 10, and 12-17 were rejected under 35 U.S.C. 102(b) as anticipated by Li et al. as evidenced by Nakano et al. Applicants

traverse this ground of rejection. More specifically, independent claim 1 is amended herein to incorporate the subject matter of claim 7, rendering moot this ground of rejection.

Additionally, claims 1 and 18-19 were rejected under 35 U.S.C. 102(a) as anticipated by Lew et al. as evidenced by Nakano et al. Applicants traverse this ground of rejection. More specifically, independent claim 1 is amended herein to incorporate the subject matter of claim 7, and therefore this ground of rejection is now moot. Additionally, Lew fails to disclose a method in which catalyst is grown epitaxially in both a single-crystal zone of the membrane as well as a single-crystal substrate common to numerous pores. Instead, Lew teaches a method in which catalyst is deposited only into the bottom of the pores (see Fig. 1(b) of Lew). For this additional reason, amended claim 1, as well as claims 2-6 and 8-19 depending directly or indirectly therefrom, is patentable over Lew et al.

Still further, claims 1, 20-21, and 23-24 were rejected under 35 U.S.C. 102(b) as anticipated by Li as evidenced by Nakano. Applicants traverse this ground of rejection.

More specifically, the rejection of independent claim 1 is based on the same prior art as noted above, namely Li et al. as evidenced by Nakano, and therefore appears to be redundant. Furthermore, claim 1 is amended to incorporate the subject matter of claim 7, and therefore the rejection is rendered moot with respect to claim 1.

Regarding claims 20-21 and 23-24, independent claim 20 is amended to recite that the metallic catalyst is grown on the single-crystal zone of the nanoporous membrane and on the single-crystal substrate common to numerous pores. Li fails to disclose or suggest a catalyst that is present in both the single-crystal zone of the membrane and the single-crystal substrate common to numerous pores, as specified in claim 20. Instead, Li teaches that the catalyst is deposited onto the bottom of the pores. More specifically, the last sentence beginning on page 367 and continuing onto page 368 of Li states, "The next step is to electromechanically deposit a small amount of cobalt catalyst into the bottom of the template channels [Fig. 1(a), center]." Because Li does not disclose each of the elements recited in claims 20-25, it follows that the claims are not anticipated thereby. Additionally, Li fails to disclose or suggest that it would be desirable or even possible to provide a component having catalyst grown epitaxially on the single-crystal zone of the membrane and on the single-crystal substrate common to numerous

pores, and therefore a prima facie case of obviousness has not been established. Accordingly, independent claim 20, as well as claims 21-24, are patentable over the cited prior art.

Original claim 7 was rejected under 35 U.S.C. 103(a) as obvious over Li in view of Masuda et al. and U.S. Patent No. 4,784,973 to Stevens et al. ("Stevens"). Applicants traverse this ground of rejection to the extent it applies to amended claim 1, which now incorporates the elements of claim 7 as well as additional subject matter.

More specifically, claim 1 as amended, as well as claims 2-6 and 8-19 depending directly or indirectly thereon, recites a method of synthesizing electronic components incorporating filamentary structures. The method includes preparing a nanoporous membrane in a manner that ensures that the wall of the pores includes a single-crystal zone, and growing at least some of a catalyst epitaxially on the single-crystal zone and on the single crystal substrate common to numerous pores.

The combination of Li, Masuda, and Stevens fails to disclose or suggest epitaxially growing a catalyst on both the single-crystal zone of the membrane as well as a single-crystal substrate common to numerous pores, as recited in claim 1. As noted above with respect to the anticipation rejection of independent claim 20, Li teaches that the catalyst is deposited onto the bottom of the pores, contrary to what is now specified in claim 1. The secondary reference to Stevens is used to show the use of single crystal silicon wafers as substrates. The further reference to Masuda is used to show a nanoporous membrane that is made in a thin layer that is transferred or deposited onto a single crystal substrate. Neither Stevens nor Masuda disclose or suggest growing catalyst on both the membrane and the substrate common to numerous pores, and therefore the combination of Li, Masuda, and Stevens fails to disclose or suggest each element of claim 1. Accordingly, this ground of rejection must be withdrawn.

The Office action included additional grounds of rejection asserted against the dependent claims. Each of the rejections not specifically addressed above has been rendered moot in view of the amendments to the claims, and therefore must now be withdrawn.

CONCLUSION

It is submitted that the present application is in good and proper form for allowance. A favorable action on the part of the Examiner is respectfully solicited. If, in the opinion of the Examiner, a telephone conference would expedite prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

The Patent Office is hereby authorized to credit any overpayment or charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith to our Deposit Account No. 50-3629.

Dated: March 4, 2009

Respectfully submitted,

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